

## Patent Claims

1. An orthopaedic device for the correction of wrongly positioned toes, having a first fastening provision (8a, 6) in the region of the big toe, a second fastening provision (8b, 5) in the region of the central foot and a flexible splint (9), which is held by the fastening provisions (8a, 8b, 5, 11) and which extends along the inner side of the foot wherein the flexible splint (9) is formed as a hinged flexible splint, articulated in the direction of flexion and extension (20) of the toe or toes requiring correction.

2. A device in accordance with Claim 1 wherein the orthopaedic device (1) includes a stocking (2) or similar enclosing element for a foot that carries the fastening mechanisms (8a, 8b, 5, 6) and the flexible splint (9).

3. A device in accordance with Claims 1 and/or 2, wherein the flexible splint (9) has hinged splint shanks (10, 11) whose three-dimensional form may or may not be plane.

4. A device according to one or more of the foregoing claims, wherein the hinged splint shanks (10, 11) have a lenticular cross-section.

5. A device according to one or more of the foregoing claims, wherein the flexible splint (9) has a hinge mechanism (13) having a pivot axis (12) that corresponds approximately to the joint axis of the main big toe joint in the direction of flexion and extension.

6. A device according to one or more of the foregoing claims,  
wherein the stocking (2) is open in the region of the toes.

7. A device according to one or more of the foregoing claims,  
wherein the device (1) incorporates a holder for the big toe,  
e.g. a big toe pouch (4) that is joined as one piece with the  
stocking (2) or that is attached to this stocking (2).

8. A device according to one or more of the foregoing claims,  
wherein the big toe pouch (4) fully encloses the big toe and  
which is open or closed at the free toe end.

9. A device according to one or more of the foregoing claims,  
wherein the device (1) incorporates an annular binding (5) in  
the region of the central foot, favourably entirely  
surrounding the central foot and connected to the stocking  
(2).

10. A device according to one or more of the foregoing claims,  
wherein the first annular binding (5) surrounds the outside  
of the stocking (2) in the region of the central foot.

11. A device according to one or more of the foregoing claims,  
wherein a second annular binding (6) fully encloses the big  
toe pouch (4) in the region of the free end of the big toe,  
and fully surrounds the big toe.

12. A device according to one or more of the foregoing claims,  
wherein the annular bindings (5, 6) are formed of a flexible, supple material resistant to tension in the circumferential direction.

13. A device according to one or more of the foregoing claims,  
wherein in the region of one inner side of the foot (7) both the first annular binding (5) and the second annular binding (6) in some areas are not joined to the stocking (2) or to the big toe pouch (4), so that between the annular bindings (5, 6) and the big toe pouch (4) or the stocking (2) fastening/holding provisions (8a, 8b) are formed.

14. A device according to one or more of the foregoing claims,  
wherein the fastening provisions (8a, 8b) consist of push-in pockets.

15. A device according to one or more of the foregoing claims,  
wherein the flexible splint (9) incorporates a first hinged splint shank (10) and a second hinged splint shank (11) which are able to pivot around an axis (12) having an articulated connection through a hinge mechanism (13).

16. A device according to one or more of the foregoing claims,

wherein the first hinged splint shank (10) extends from the hinge mechanism (13) to the fastening provision (8a) and the second hinged splint shank (11) extends to the second fastening provision (8b).

17. A device according to one or more of the foregoing claims,

wherein a foot-spreading pad (14) is used in the area of the sole of the foot behind the main joints of the toes for retrocapital support of the central foot.

18. A device according to one or more of the foregoing claims,

wherein the fastening provisions (8a, 8b) are formed as pouches sewn onto this stocking (2) or fixed in some other way.

19. A device according to one or more of the foregoing claims,

wherein the stocking (2) is a compression stocking.

20. A device according to one or more of the foregoing claims,

wherein the hinge mechanism (13) consists of the first hinged splint shank (10), the second hinged splint shank (11) and a hinged splint shank connecting mechanism (14a), in particular a tubular rivet.

21. A device according to one or more of the foregoing claims,  
wherein the hinged splint shanks (10, 11) each have a free end (15) and an end at the hinge (16).

22. A device according to one or more of the foregoing claims,  
wherein the ends (16) near the hinge have a three-dimensional form similar to that of a ball joint, and are formed so as to correspond to each other in such a way that each of the hinge ends (16) of the hinged splint shanks (10, 11) can be inserted into one another and interlock.

23. A device according to one or more of the foregoing claims,  
wherein the hinged splint shanks (10, 11) and the hinge mechanism (13) have a three-dimensional form adapted to the shape of the patient's foot.

24. A device according to one or more of the foregoing claims,  
wherein the hinge ends (16) of the hinged splint shanks (10, 11) have a form corresponding to one another with rotational symmetry about the axis (12).

25. A device according to one or more of the foregoing claims,  
wherein the hinged splint shanks (10, 11) are manufactured from metal or plastic, in particular from thin, carbon-fibre reinforced plate.

26. A device according to one or more of the foregoing claims,

wherein a force  $F_1$  can be exerted on the big toe in the direction of the inner side of the foot by the flexible splint (9) for lateral correction of the big toe.

27. A device according to one or more of the foregoing claims,

wherein there is a provision for exerting the force  $F_1$  on one or more neighbouring toes.

28. A device according to Claim 27,

wherein the provision consists of a tension element which joins a toe holder for more than one of the toes of a foot.

29. A device according to one or more of the foregoing claims,

wherein the hinged splint shanks (10, 11) have a three-dimensional form substantially that of a plate, longitudinally and laterally convex, having a first longitudinal boundary (52, 82) and a second longitudinal boundary (53, 83) as well as a narrow boundary (54, 84).

30. A device according to one or more of the foregoing claims,

wherein in the region of the longitudinal boundaries, and parallel to them, slots (55, 85) are provided, with the effect that a central stay (56, 86), edge stays (57, 87) and intermediate stays (88) are formed.

31. A device according to one or more of the foregoing claims,

wherein the convexities of the hinged splint shanks (10, 11) are longitudinally and transversely adapted to the anatomical features of a foot.

32. A device according to one or more of the foregoing claims,

wherein the annular bindings (5, 6) are joined to the hinged splint shanks (10, 11).

33. A device according to one or more of the foregoing claims,

wherein the annular bindings (5, 6) incorporate loop straps (60, 50) and free ends (51, 61).

34. A device according to one or more of the foregoing claims,

wherein the hinge mechanism (13) is formed as an annular hinge with a hinge ring (70) and a hinge disk (90).

35. A device according to one or more of the foregoing claims,

wherein the hinge ring (70) is joined as one piece with the first hinged splint shank (10) and/or the hinge disk (90) is joined as one piece with the second hinged splint shank (11).

36. A device according to one or more of the foregoing claims,

wherein the hinged splint shanks (10, 11) have a material thickness that tapers towards each of the edge regions.

37. A device according to one or more of the foregoing claims,  
wherein the surface regions of the hinged splint (9) that lie along the patient's foot are smooth.

38. A device according to one or more of the foregoing claims,  
wherein an annular ridge (91) is moulded onto the hinge disk (90), and this operates in combination with the hinge ring (70) with the result that radial relationship of the hinge disk (90) and of the hinge ring (70) is maintained.

39. A device according to one or more of the foregoing claims,  
wherein for axial positioning of the hinge ring (70) relative to the hinge disk (90) engaging elements (92) that operate together with a step, in particular an annular step (73), are provided.

40. A device according to one or more of the foregoing claims,  
wherein the hinge mechanism (13) is covered by a closing cap (100).

41. A device according to one or more of the foregoing claims,  
wherein the closing cap (100) is connected to the hinged splint (9) by engaging devices (96, 101).



42. A device according to one or more of the foregoing claims,

wherein the longitudinal extension of the hinged splint shanks (10, 11) enclose an angle  $\alpha$ ,  $\beta$  with the pivot axis (12), and where the angles  $\alpha$  and  $\beta$  are chosen in such a way that the hinged splint (9) can be placed against a patient's foot in such a way that the pivot axis (12) of the hinge mechanism (13) is approximately in line with the anatomical joint axis of the main big toe joint.

43. A device according to one or more of the foregoing claims,

wherein the angle  $\alpha$  is between  $75^\circ$  and  $115^\circ$ .

44. A device according to one or more of the foregoing claims,

wherein the angle  $\beta$  is between about  $70^\circ$  and  $110^\circ$ .

45. A device according to one or more of the foregoing claims,

wherein the closing cap (100) is joined to the hinged splint shank (10).

46. A device according to one or more of the foregoing claims,

wherein the closing cap (100) is joined to the hinged splint shank (11).

47. A device according to one or more of the foregoing claims,

wherein the closing cap (100) is formed as an axial bearing.

48. A device according to one or more of the foregoing claims,

wherein the hinged splint (9) is manufactured from plastic, in particular from a plastic resistant to impact and not irritating to the skin, e.g. of the polycarbonate class.

49. A device according to one or more of the foregoing claims,

wherein the bindings (5, 6) around the central foot and around the big toe of the patient are positioned or threaded through the hinged splint shanks (10, 11) without creating steps.

50. A device according to one or more of the foregoing claims,

wherein the annular bindings (5) are fully threaded into the hinged splint shank (11) prior to application to the patient's foot.

51. A device according to one or more of the foregoing claims,

wherein the device (1) is not fixed rigidly to the foot, so that when worn the device (1) can adapt the position of the hinge axis (12) of the hinge mechanism (13) individually to the anatomical features of the patient's foot.